Europäisches Patentamt
European Patent Office
Office européen des brevets

Description of DE10112710	Print	Copy	Contact Us	Close

Result Page

The invention relates to a plate heat exchanger, existing from essentially planar heat exchanger plates, which exhibit an erected, a circumferential, outer edge and at least four openings and so into one another the stacked and connected by means of solders are that the openings are vertical channels from the plate heat exchanger devoted and between the heat exchanger plates of flow passages for different fluids present, whereby the peripheral edge that exhibits the stack of the heat exchanger plates a final heat exchanger plate bending various of the edges of the other heat exchanger plates. Furthermore the invention concerns a manufacturing process for the plate heat exchanger.

The plate heat exchanger corresponds the DE to 196 28 561 c1. The Fig. 4 and 6 of this document shows that the edge of the highest heat exchanger plate is inward bent, while all other edges uniform and drip-tray type upward directed are. This measure often discovers difficulties, because ports or other elements very dense at the mentioned edge arranged belonging to the plate heat exchanger to become to have.

The invention is the basis the object in such a way to train the plate heat exchanger further from the preamble and indicate a suitable manufacturing process, become precluded with which the mentioned difficulties.

The solution according to invention plans that the edge is that the stack of the heat exchanger plates final heat exchanger plate over the edge of the heat exchanger plate bent arranged under it.

By this measure for example a port can become immediate arranged adjacent at the edge, without discovering difficulties. Furthermore thereby the stability in the edge of the highest heat exchanger plate was improved. The heat exchanger plates exhibit an ordinary extreme small sheet thickness, why the edge of such plate heat exchangers, which are designed not according to invention, in the operation or already with the transportation to the customer or with the incorporation often damaged, D. h. one bends or even one tears. Furthermore such edges extreme are sharp edged, whereby dangers of injury become caused. The formation according to invention works against all.

▲ top

The avoidance of such dangers of injury, which are also a risk regarding product liability, protective covers became from plastic provided with known plate heat exchangers, which can be void after the invention, which brings a cost saving with itself.

In other formation is provided that the edge at that is attachable the stack of the heat exchanger plates final heat exchanger plate before that stacks of the heat exchanger plates by means of a material-deforming tool. This measure has itself as significant simple and inexpensive put out as the known transformation of the edge at the finished soldered plate heat exchanger. Additional one became found that by this measure the sharp edge is deburred, D. h. less sharp edged made and/or. truncated will can.

Furthermore as favourable considered becomes, if the end of the bent edge vertical stands for bent to the plane of the heat exchanger plates or is slight more other, to the plate heat exchanger. Thus the danger of injury becomes other degraded.

The manufacturing process according to invention plans that the edge that the stack of the heat exchanger plates final heat exchanger plate in a material-deforming tool outward bent will and the heat exchanger plate becomes set thereafter on the stack of the heat exchanger plates, whereby their edge takes the edge off of the heat exchanger plate located under it.

The edges of the heat exchanger plates, which form the stack, preferably are from simplest shape, whereby small tool - and manufacturing costs effected become. They are only simple and drip-tray type erected and the heat exchanger plates are so into one another stacked that their edges at the finished plate heat exchanger provide a shed-like structure for the same. The final heat exchanger plate possesses the same shape as all remaining heat exchanger plates before the bending procedure of its edge.

The invention becomes subsequent described in an embodiment, to which becomes taken on the accompanying images respect.

Show:

Fig. 1 perspective view of the plate heat exchanger;

Fig. 2 section II-II by the plate heat exchanger of the Fig. 1;

Fig. 3 detail III from the Fig. 2;

Fig. 4 similar Fig. 3;

Fig. 5 enlarged cutout of a corner of the plate heat exchanger;

The plate heat exchanger of the embodiment is provided for the heat exchange between more than two fluids. It possesses therefore special pick-up flanges 1; 2; 3, those as connecting adaptor 1; 2 formed are, as in the DE 196 28 561 c1 and also in the DE 196 28 560 c1 described and shown became. On these details it depends less in the present context, however it is to be pointed out that in particular the pick-up flange 1 very close at the edge 9 of the plate heat exchanger and/or. the heat exchanger plates 8; 13 arranged is, over this edge 9 outside is enough even partly, like it also from the Fig. 2, on the top right, to see is. The pick-up flanges 1, 2, 3 possess bores 20, who serve the attachment at the adapters not shown at a transmission or such a thing. The plate heat exchanger possesses one in the sheet thickness somewhat strengthened base plate 15, whose corners are 16 upward bent and rest against the edge 9 of the lower heat exchanger plates 8, in order to give to the stack an improved stability. A top plate 19 lies above on the highest heat exchanger plate 13. All heat exchanger plates 8; 13 possesses in each case four circular openings, those after that stacks of the heat exchanger plates 8; 13 the channels 4; 5; 6 and 7 results in, which serve and the discharge of the fluids. For example the supply of a refrigerant could take place at the channel 5, which leaves the plate heat exchanger at the channel 7 again, after it all flow passages 12 (Fig. 2) flowed through and the warm one of the other fluids received has. At the channel 4 such a heat-emitting fluid flows and at the channel 6, after it flowed through at least some the flow passages 11. An other heat-emitting fluid flows at the channel 17 and at the channel 18.

In the flow passages 11; 12 is turbulence employments 21, in order to improve the efficiency of the heat exchange.

The heat exchanger plate 13, which represents highest the heat exchanger plate in the embodiment, which does not differ otherwise from the other heat exchanger plates 8, becomes before its putting on on the stack of the heat exchanger plates 8 in a simple material-deforming tool (to not shown) machined, around the edge 10, as in Fig. 3 shown to transform. In the embodiment after Fig. the end 14 of the edge 10 vertical stands for 3 on the plane of the heat exchanger plates 8; 13. With in Fig. 4 embodiment shown this end 14 still other toward to the plate heat exchanger bent became, whereby the danger of injury became other attenuated with the handling. After this transforming operation the heat exchanger plate top becomes fitted as the highest heat exchanger plate 13 on the stack.

The figs show descriptive the simpleness of the edges 9 and the shed-like structure at the edge 9 of the plate heat exchanger.

As other variant became in Fig. 5 shown that it is favourable to free-cut the edge 10 of the heat exchanger plate 13 at the corners. This is favourable, If the pick-up flange 3 is very dense at the edge 9 of the plate heat exchanger arranged or over it out-stood. In this portion the danger of injury is small, because the pick-up flange 3 makes the accessibility more difficult to the corner region.

All parts shown or previously mentioned of the plate heat exchanger become connected with one another after their composition in the charcoal brazier in a single soldering operation.

Europäisches Patentamt
European Patent Office
Office européen des brevets

Claims of DE10112710	Print	Copy	Contact Us	Close

Result Page

1. Plate heat exchanger, existing from essentially planar heat exchanger plates (8) arbitrary number, which exhibit an erected, a circumferential, outer edge (9) and at least four openings and so into one another the stacked and connected by means of solders are that the openings vertical channels (4; 5; 6; 7) in the plate heat exchanger and between the heat exchanger plates (8) flow passages (11 result In; 12) for different fluids present are, whereby the peripheral edge (10) exhibits that the stack of the heat exchanger plates (8) final heat exchanger plate (13) one of the edges (9) of the other heat exchanger plates (8) various bending, characterised in that the peripheral edge (10) of the final heat exchanger plate (13) over the edge (9) of the heat exchanger plate (8), arranged under It, bent are.

2. Plate heat exchanger according to claim 1, characterised in that bending at the edge (10) that the stack of the heat exchanger plates (8) final heat exchanger plate (13) before that stacks of the heat exchanger plates (8; 13) by means of a material-deforming tool is attachable.

3. Plate heat exchangers according to claim 1 or 2, characterised in that the end (14) of the bent edge (10) vertical to the plane of the heat exchanger plates (8; 13) stands or other inwardly bent is.

4. Plate heat exchanger after one of the managing claims, characterised in that the edge (10) at the corners free-cut is.

5. Method to the production of the plate heat exchanger, after one of the claims 1 to 4, characterised in that the edge (10) that the stack of the heat exchanger plates (8) final heat exchanger plate (13) in a material-deforming tool outward bent will and the heat exchanger plate (13) after it on the stack of the heat exchanger plates (8) set becomes, so that their edge (10) takes the edge off (9) of the heat exchanger plate (8), located under it.

▲ top